



# US Army Next Generation Breaching Technology – Explosive Breacher





UNCLASSIFIED



# What do US Army Engineers Do?

## Mobility

- Obstacle Breaching
- Gap crossing



## Counter Mobility

- Close
  - Lethal
  - Non-lethal
- Mid/Deep
- Physical
  - Ditches
  - Fence



## Survivability/General Engineering

- Blast mitigation
- Vehicle and Soldier protective positions
- Infrastructure
- Route repair & maintenance
- Airfield damage repair
- Port opening & repair



How do we do this in the future?



UNCLASSIFIED

# Mobility



## Breaching – now



### Explosive

Ineffective against modern complex mines  
Slow to reload  
Not scalable for deep obstacles

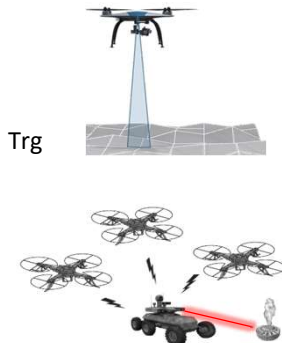
### Mechanical

Soldier in the breach  
Slow <10km/hr  
Bespoke equipment,  
hard/expensive to  
repair/replace

## Future

Effective against all explosive threats  
Quick and efficient to reload (minimal Trg required)  
Scalable for deep obstacles

Autonomous  
Inexpensive or highly resilient



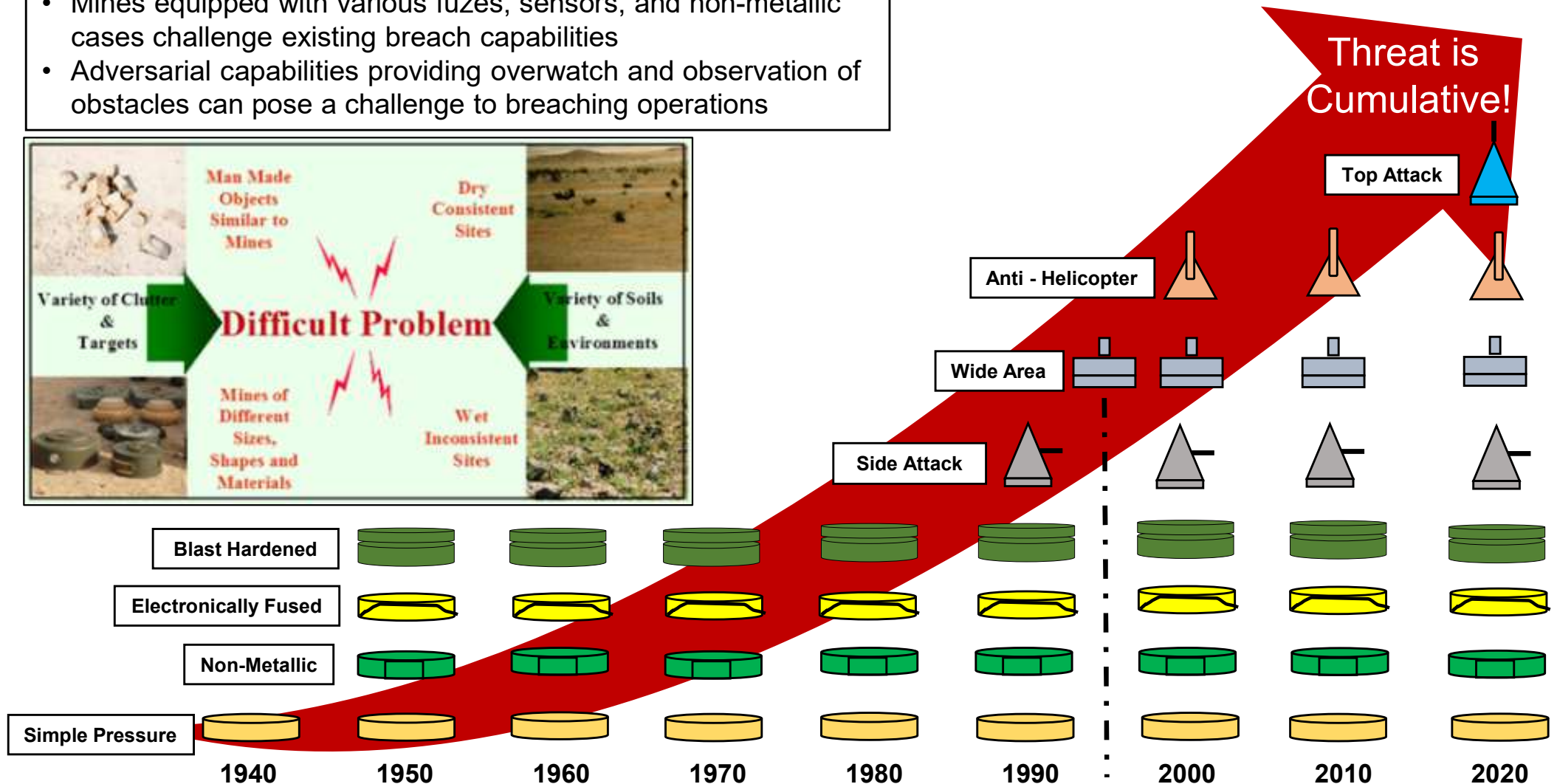


# The Expanding Explosive Hazard Problem



- Near-peer and peer competitors represent the most likely and most stressing threat
- Mines equipped with various fuzes, sensors, and non-metallic cases challenge existing breach capabilities
- Adversarial capabilities providing overwatch and observation of obstacles can pose a challenge to breaching operations

**Booby Traps, AP Mines, IEDs, and Unexploded Ordnance (UXO) makes the problem even worse!**



DISTRIBUTION STATEMENT A. Approved for public release: distribution unlimited. PAO#169-24

Over 2,500 types of mines in the world





# Army Modernization Strategy and Impacts



ON **EVERY**  
**MISSION**

## Why Should we modernize?

- Peer and near peer adversaries continued to modernize their obstacle capabilities by leveraging technology. While US has been in counterinsurgency (COIN) operations for 20yrs.
- The Research and Analysis Center (TRAC) to conduct a Complex Obstacle Reduction in Multi-Domain Operations (CORMDO) Study. Citing 14 out of 33 NTC rotations from 2014-2018, Mine Clearing Line Charge (MICLIC) Operational Readiness (OR) rate for the launchers fell below 50% vs requirement of 78%.
- Modeling scenarios results showed 100% catastrophic damage with 50% redundancy, and 0% completion of any of the complex obstacle reduction.
- In Jan 2019, the House Armed Service Committee report cited the MICLIC deficiencies of sustainability and age of the line charge averaging of 25 yrs.

**Concluding** To maintain freedom of maneuver for the fight tonight. The Army must continue to improve the RAM, effectiveness and survivability of current breaching systems. To overcome these limitations in the future, there needs to be investments into testing, development, suitability, and feasibility to support the Armed Forces freedom of maneuver of 2030-2040.

## Enables key Army modernization initiatives by accomplishing:

- The GOBLN capability will provide Increased stand-off for 1) Detection/Targeting 2) Neutralization 3) Digital Marking 4) Reporting.
- Proportionate neutralization to the threat obstacle, Modular Mission Payload to current and future prime-movers vehicles (i.e., Robotic Combat Vehicle (RCV), Assault Breaching Vehicle (ABV), & Optional Manned Fighting Vehicle (OMFV)).
- Integration in the future with near real time Common Operating Picture updates via remote explosive hazard and obstacle identification by incorporating geospatial data into mission command systems.

## Training:

- The MICLIC has been unit trained since first unit equipped and continues to be train the trainer, as a perishable skill.
- GOBLN vision for training is to utilize training simulators, training rounds, and capstone with live fire training/qualifications. This may require a specific Additional Skill Identifier (ASI).



# Background and Capability

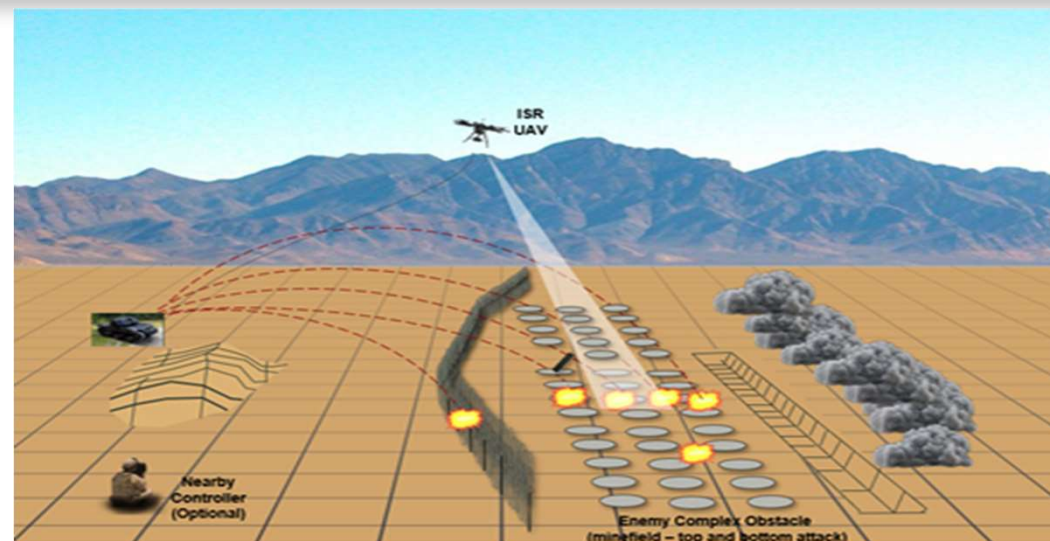


ON **EVERY**  
**MISSION**

## Task: Breaching at Standoff

### Key Facts

- Next Generation Combat Vehicle (NGCV) Endorsement: **MAY 2020**
- Acquisition Shaping Panel: **13 JUN 22**
- Abbreviated – Capabilities Development Document (A-CDD) Requirement Validated by AFC: **6 JUL 22**
- Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT) Acquisition Decision Memorandum (ADM) Signed: **3 DEC 22**
- Joint Program Executive Office Armaments & Ammunition (JPEO A&A) ADM Signed: **17 MAR 23**
- Milestone B (MS B) Planned for \*2QFY26



### Assumptions

- Future Approved Acquisition Objective (AAO) will mirror trailer mounted MICLIC system
- **Leveraging Technology Readiness Level (TRL) 5-6 Government-developed subsystems for an FY24 Concept Demonstration**
  - Transitioning NGCV-Cross Functional Team (CFT) endorsed Ground Obstacle Breaching Lane Neutralizer (GOBLN) Science & Technology (S&T) effort developed by Development Command – Armaments Center (DEVCOM-AC) for obstacle neutralization
  - Utilizing DEVCOM-AC S&T automated 81mm mortar system as surrogate neutralization delivery method
  - Utilizing Unmanned Aerial System (UAS) sensor package and Automated Target Recognition (ATR) developed by DEVCOM Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Center Research and Technology Integration (RTI)

### Capability

- The XM123 GOBLN provides a Modular Mission Payload (MMP) for current and future vehicle platforms that is a reliable, scalable, and capable of providing targeted effects at stand-off ranges against current and emerging explosive and non-explosive obstacles.
- The XM123 GOBLN future remote capability aligns with the NGCV-CFT priorities and Remote Combat Vehicle (RCV) breaching
- Removing Soldiers from the breach area.

**XM123 GOBLN is #12 #3 on United States Army Engineer School (USAES) priority list**



# Abbreviated – Capabilities Development Document Desired Characteristics



ON **EVERY**  
**MISSION**

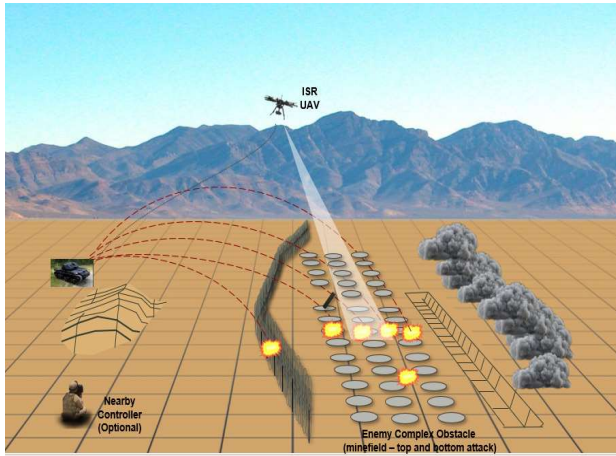
Desired Characteristics (DC)	
Priority	Description
DC #1: System Stand-Off	+/-1KM forward edge of obstacle
DC #2: Neutralize Explosive Hazards	Current and future Explosive Hazards (EH), up to 150m lane depth in a single combat load.
DC #3: Detection/ Sensors	Detection/Sensor targeting
DC#4: Fire Control Station	Manual and remote at +/- 1.6KM.
DC #5: Scalability	Neutralization proportionate to obstacle.
DC #6: Modular Mission Payload	Current and future manned or unmanned prime movers.
DC #7: Load and Reload	Load and reload with organic personnel and equipment in an operational environment
DC #8: Reporting	Provide obstacle information to the Command Post Computing Environment
DC #9: Marking	Provide an initial lane marking system by digital means
DC #10: Reliability	90% chance of successful mission employment
DC #11: Maintainability	Field Level Maintenance Ratio (MR) will not exceed 0.19 Maintenance Man-hours per Mission
DC #12: Cyber Survivability	Operate in a cyber-contested environment

**Future breaching capability must reduce obstacles, provide a passable lane for maneuver, and remove Soldiers from the point of breach!**

# DEVCOM TMRR Concept



ON **EVERY**  
**MISSION**

Program Description	XM123 Desired Capabilities
<p>The GOBLN will replace the M58 MICLIC system.</p> <ul style="list-style-type: none"> <li>• Current and future near-peer counter mobility capabilities challenge current capability</li> <li>• Obsolescence / Reliability issues due to average system age of 25 years</li> <li>• GOBLN will be a modular, scalable solution providing targeted effects against current and emerging explosive and non-explosive hazards</li> </ul>	<ul style="list-style-type: none"> <li>• Standoff +/- 1KM</li> <li>• Detect &amp; Neutralize EHs (Current &amp; Future, Surface &amp; Buried)</li> <li>• Scalable effects</li> <li>• Modular Mission Payload</li> </ul> 

## Current Government TMRR Concept



R80D



Multi-Mission  
Payload

### Capabilities

- Electro-Optical (EO) / Infrared (IR) sensor with on-board ATR processing, data storage, and range-finder capabilities
- Provide real-time situational awareness
- Trained algorithms using real and synthetic data



Automated Direct/ Indirect Mortar

### Capabilities

- Modular 81mm platform
- Recoil mitigation, on-board fire control with weapon auto-laying, and 20-round autoloader
- Existing Mortar Fire Control System (MFCS) will be tailored for Combat Engineers use



M821A4 (81mm HE)

### Capabilities

- In production and qualified.
- Multimode fuse
- Demonstrated effectiveness against EHs



**ON EVERY MISSION**



# XM123 GOBLN Technology Maturation and Risk Reduction Test Strategy



ON **EVERY**  
**MISSION**

## Touchpoint 1

### Subsystem: Launcher

✓ **Conducted** Oct 2022 @ Picatinny, NJ

#### Purpose

- Demonstrate DEVCOM-AC Launcher subsystem: Automated Direct / Indirect Mortar (ADIM) to support stand-off neutralization concept

#### Findings

- Demonstrated modularity, scalability, system stand-off, and remote fire control
- Demonstrated Firestorm integration
- Assessed ADIM TRL/MRL

## Touchpoint 3:

### Munition Neutralization

○ Planned 2QFY24 @ YTC, Yuma AZ

#### Purpose

- Dynamic live-fire demonstration of 81mm HE Mortar on surface laid targets to determine effectiveness

#### Goals

- Determine munition efficacy against surrogate targets
- Inform Capability Development Document (CDD) requirements
- Provide forum for industry and government to engage/collaborate
- Allow Industry to demonstrate alternative munitions

## Touchpoint 5:

### Integration Demo

○ **Planned** 2QFY25, Location: TBD

#### Purpose

- Final concept demonstration for the user prior to MS B

#### Goals

- Final TRL/MRL assessment
- Develop cost, schedule, performance planning for EMD
- Confirm CDD Requirements
- Inform EMD Contract
- Prepare for Industry Day post-MS B

## Touchpoint 2:

### Subsystem: Detection

✓ **Conducted** 12 APR @ FT AP Hill

#### Purpose

- Demonstrate DEVCOM -C5ISR's detection sensor payload with Aided Target Recognition (AiTR)
- Demonstrate integrated with Firestorm and Mortar Fire Control System

#### Findings

- Validated detection at standoff
- Successful Integration with Firestorm and legacy Mortar Fire Control System.
- Assessed TRL/Manufacturing Readiness Level (MRL) of detection concept

## Touchpoint 4:

### Gov't Concept & Industry Tech Demonstration

○ Planned 4QFY24 @ YTC, Yuma, AZ

#### Purpose

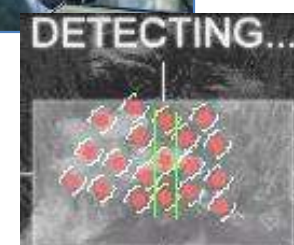
- DEVCOM (AC & C5ISR) will demonstrate critical subsystem concepts against a surrogate minefield.
- Industry partners will be invited to demonstrate their TRL 6+ concepts (System or Subsystem Level)

#### Goals

- Assess TRL/MRL concepts
- Inform CDD requirements
- Shape Engineering & Manufacturing Development (EMD) strategy
- Provide forum for industry and government to engage/collaborate
- Allow Industry to demonstrate alternative solutions



Remote detection of explosive and non-explosive items of interest



Neutralization achieved at standoff (~2.6KM)